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inch long. Panicle long exserted, ¼ of an inch long, the numerous erect or but slightly spreading branches single or in pairs, simple or branched, varying in number and length, smooth below. Rachis of the spikes jointed, each joint 1½ lines long, flattened, densely bearded on the edges, hairs at the base of each spikelet a little shorter than or (usually) exceeding it by a line or so. Pedicel of the neutral floret flattened and bearded like the joints of the rachis, 1–2 lines long. Outer glume oblong-lanceolate, flattened on the back, 1½ to a little over 2 lines long, 7–9-nerved, more or less silky villous below, smooth above, strongly scabrous near the tip and on the upper portion of the angle made by the infolding of the narrow margin; second glume a little shorter and more pointed than the first, 3-nerved, ciliate on the inturned margin, very smooth on the back; third glume neutral and without a palea, very thin and transparent, oblong, obtuse, 1–1¼ lines long; fourth glume without a palea, fertile scarcely wider than the long (5–6 lines) twisted and more or less geniculate scabrous awn into which it passes. Rudimentary floret of a single empty lanceolate glume 1¼–2 lines long; a second glume and sometimes also an imperfect awn is present.

Dr. Torrey, in his description, says: "Nodes smooth, leaves very smooth on both sides, stipule obsolete, palets two, shorter than the glumes, the lower terminating in a slightly contorted awn. The other portions of Dr. Torrey's description agree with that given above. He mistook the nature and relative position of the "palets," or as he had it, "*corolla*," which he said was "two-valved." There are two valves within the two outer glumes, but they are the lower palets of two flowers, the lower one being neutral, and both destitute of upper pales; and it is the upper one which is awned.

F. LAMSON SCRIBNER.

Notes on the Trees of the South-west.—The San Francisco Mountains here mentioned are in the extreme eastern part of Arizona, just north of the Gila and west of the San Francisco River. The Burro and the Bear Mountains extend in a north-westerly direction, from points a little to the west of Silver City, to the Gila River, being separated from one another by the Mangus basin. The Bear Mountains are the northern ones. The Mogollon Mountains are situated in the extreme western part of New Mexico, between the Gila and San Francisco Rivers, a little north-east of the San Francisco Mountains.

The only wooded sections are in the mountains, and the hills near them, and along the streams.

Fouquiera splendens, Engelm.—This plant, although a shrub, is introduced here on account of the general use to which the wood is put by the Mexicans. It is very peculiar, and, in flower, it is handsome. It is commonly known as "coach-whip cactus," or simply "coach-whip." It is very largely used by the Mexicans in South-western Arizona for fencing, the poles being set up contiguously in trenches, and bound by a row placed horizontally near the top. The thorns render such a fence impassable. The plants are also occasionally used for roofing-poles.

Prunus Capollin, Zucc., is, with the exception of the mahogany, the only fruit-tree that I have found in the South-west, and the fruit of this is poor enough. It grows in the rich, light soil of the cañon-bottoms, attaining a size a little greater than that of *Prunus Virginiana*. It is very prolific.

Sapindus marginatus, Willd., is known in South-western New Mexico as "China tree." It grows with a single straight trunk, and reaches a height of 10 or 12 feet, and occasionally has a diameter of 6 inches. The fruit is said to be of value in malaria. I have sometimes had occasion to use the wood for ramrods, and have found it very light and strong. It grows in light soil along streams and valleys at the base of the mountains.

Negundo aceroides, Moench., grows commonly along mountain streams. It reaches a diameter of about 12 or 15 inches.

Prosopis juliflora, DC. — Legumes extensively used for horse-fodder, when grain cannot be obtained.

Fraxinus pistaciaefolia, Torr.—This polymorphous species is abundant along all mountain streams, in rocky places, often growing in rock-crevices where no soil is apparent, with its feet variously flattened and deformed to fit the crevices. The leaves vary much as to form, margin and surface, being from ovate-oblong to obovate, and from glabrous to short tomentose. Like most of the hard-wood timber of the Gila country, it is very subject to decay, but when sound it is highly valued for the purposes for which white ash is commonly used. It is apparently the material of which the prehistoric people of the Gila formed their bows.

Chilopsis saligna, Don., grows only near water, and delights in a sandy soil. It is one of the most beautiful of trees when in flower. It occasionally has a diameter of nearly or quite a foot. The wood resembles that of the black walnut in color, though somewhat lighter and with a satiny gloss. It would apparently be valuable for cabinet-work, as it is beautiful, and capable of taking the peculiar and handsome polish of sumac.

Celtis reticulata, Torr.—This species was observed only in the Burro Mountains. The wood is very white, smooth, sound, compact and heavy, and would apparently be valuable for turning purposes. The trunk is very short, seldom reaching a height of more than three feet before forking, and the branches are crooked and branching, so that no large pieces of the wood are available.

Morus microphylla, Buckley.—Very common in open cañons of the Burro Mountains, and mountains southward. It reaches a height of 20 feet, and a diameter of 6 to 9 inches. The fruit, though small, is sweet and pleasant when ripe. The trunk is variously flattened, twisted and distorted, and the bark is seldom entirely continuous except in small specimens.

Platanus Wrightii, Watson.—Common and abundant in the mountain cañons, being the predominant tree of the cañon of the Mogollon Mountains. The trunk is usually very crooked, and grain more winding than in any other species.

Juglans rupestris, Engelm. — Common in cañons and valleys along and near the Gila, where it grows to rather a larger size than Rothrock's description credits it with. Near Mangus Springs there are two large specimens, one having a trunk not far from 1½ feet in diameter. The wood is as valuable as that of *J. nigra*, and the small nuts are rich and sweet.

Ophioglossum vulgatum.—This fern has not yet been credited to the Pacific coast, though its presence here has been suspected. Mr. and Mrs. Lemmon collected it last year in Arizona. In February, 1850, Dr. C. C. Parry collected it at San Diego, but he obtained only a few specimens, which were lost while en route to New York.

To-day, Dr. Parry and I rediscovered this plant growing upon the high mesa, near the public school building. We collected it in many places, widely separated. We found it with *Dodecatheon Meadia* (var.), *Saxifraga Parryi*, a small form of *Selaginella rupestris*, and a liverwort. It grows in grassy, and often stony spots, which are not specially wet; indeed, some of them are quite dry. During a large portion of the year the soil in which this fern grows is dry and hard.

No doubt, if botanists will go down upon their knees, a little close observation will result in the finding of this fern at other points in this State, and perhaps in Oregon.

San Diego, California, March 7th, 1882. D. CLEVELAND.

Hybrid Oaks.—When I settled here some thirty years ago, I found on the grounds of a Germantown gentleman, Jeremiah Hacker, a bearing tree of the European *Quercus Robur*. I have since raised hundreds of young acorns from this isolated tree. These have borne, and young trees from these have had acorns. I have two generations of fruiting trees from this single one. I can say from this experience that like usually begets like, but here and there remarkable leaps occur. Now, it may be, a tree has leaves wholly sessile, another may have leaves with petioles a quarter of an inch long. I have had instances of trees with leaves as nearly entire as those of a chestnut oak, while others would have them so deeply lobed as to be fairly pinnatifid. And the acorns vary. Some are very little longer than broad, while others are double the length, and form perfect cylinders. How or why these strange leaps occur I could never satisfy my mind. That they are not due to hybridization is certain. That it must be owing to some innate power to change, is equally clear, whatever the nature of that power may be. An interesting fact in connection with these occasional great leaps from the common form is that the change, once secured, is almost as hereditary as are the features of the parent form. Here and there, as in this parent, there will be a sudden departure, many often in the direction of the original, though not always so. I could give many illustrations from other trees, as well as from this one English oak.

The conclusion that I have been forced to is that the odd forms we often find in nature are not necessarily hybrids, but are as likely, if not more likely to be the outgrowth of some internal law of form with which we are as yet unacquainted. That they do not often perpetuate themselves is remarkable when we remember that of thousands of seeds produced on any one tree, but a very small per-